FUJITSU THE POSSIBILITIES ARE INFINITE

# POWER RELAY

# 1 POLE—3, 5, 10 A (Medium Load Control)

# FBR160 SERIES



## ■ FEATURES

- Compact with high power (3 A to 10 A)
- 6 types of contact materials available for home electronics and automotive applications
- Design conforms to the following safety standards
  UL114 File No. E63615
  UL508 File No. E536[illegible]4
  CSA No. LR64026
  Japan Electrical Appliance Control Law (150–300 V)
- For automatic assembly
  Tube packaging suitable for automatic insertion equipment is available

## ■ ORDERING INFORMATION

[Example] FBR16 (a) 1 (b) S (c) E (d) D (e) 012 (f) BH (g) –CSA (h) –*** (i) –S (j)

| | | | | |
|---|---|---|---|---|
| (a) | Series Name | FBR16: FBR16 Series | | |
| (b) | Contact Arrangement | 1 : 1 form C (SPDT)<br>3 : 1 form A (SPST-NO) | | |
| (c) | Enclosure | S : Flux free<br>N : Plastic sealed | | |
| (d) | Coil Rating | E : 360 mW type<br>C : 500 mW type (refer to the SPECIFICATIONS) | | |
| (e) | Coil | D : DC Coil | | |
| (f) | Nominal Voltage | (Example) 012: 12 VDC coil<br>024: 24 VDC coil (refer to the COIL DATA CHART) | | |
| (g) | UL Standard and Contact Material | UL 114 recognized | UL508 recognized | Material / Rating |
| | | U | R | Silver (3A) |
| | | UK | RK | Silver-cadmium oxide (3 A) |
| | | UH | RH | Silver-cadmium oxide (5 A) |
| | | UW | RW | Silver tin oxide alloy (5 A) |
| | | UHB | RHB | Silver-cadmium oxide (AC 10 A) |
| | | UWB | RWB | Silver tin oxide alloy (DC 10 A |

(Continued)

| | | |
|---|---|---|
| (h) | CSA Standard | Nil : Non- CSA<br>-CSA: CSA recognized, but only UL 114 or UL 508 types |
| (i) | Custom Designation | Suffix number for custom design |
| (j) | Package Style | Nil : Standard tray<br>-S : Tube carrier |

Note: The designation name is stamped on the top of the relay case as follows:
(Example) Designation ordered: FBR161NED012-H
Stamp: 161NED012-H



## ■ COIL RATINGS

1. E (360 mW Coil type)

| MODEL | | | | Nominal voltage | Coil resistance (±10%) | Nominal current (at nominal voltage) approx. | Must operate voltage* | Must release voltage* | Maximum allowable voltage | Nominal power | Coil temperature rise |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Form C type | | 1 Form A type | | | | | | | | | |
| Flux free | Plastic sealed | Flux free | Plastic sealed | | | | | | | | |
| FBR161SED005□ | FBR161NED005□ | FBR163SED005□ | FBR163SED005□ | 5 VDC | 70 Ω | 71 mA | 80% max. of nominal voltage | 10% min. of nominal voltage | 210% of nominal voltage | Approx. 360 mW (at nominal voltage) | Approx. 30 deg (at nominal voltage) |
| FBR161SED006□ | FBR161NED006□ | FBR163SED006□ | FBR163SED006□ | 6 VDC | 100 Ω | 60 mA | | | | | |
| FBR161SED009□ | FBR161NED009□ | FBR163SED009□ | FBR163SED009□ | 9 VDC | Ω | mA | | | | | |
| FBR161SED012□ | FBR161NED012□ | FBR163SED012□ | FBR163SED012□ | 12 VDC | 400 Ω | 0 mA | | | | | |
| FBR161SED024□ | FBR161NED024□ | FBR163SED024□ | FBR163SED024□ | 24 VDC | 1,6 Ω | mA | | | | | |

Note: All values in the table are measured at 20°C.
*: Specified values are subject to puls wave voltage.

2. C (50 mW Coil type)

| MODEL | | | | Nominal voltage | Coil resistance (±10%) | Nominal current (at nominal voltage) approx. | Must operate voltage* | Must release voltage | Maximum allowable voltage | Nominal power | Coil temperature rise |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 Form C type | | 1 Form A type | | | | | | | | | |
| Flux free | Plastic sealed | Flux free | Plastic sealed | | | | | | | | |
| FBR161SCD005□ | FBR161NCD005□ | FBR163SCD005□ | FBR163SCD005□ | 5 VDC | 50 Ω | 100 mA | 75% max. of nominal voltage | 10% min. of nominal voltage | 210% of nominal voltage | Approx. 500 mW (at nominal voltage) | Approx. 35 deg (at nominal voltage) |
| FBR161SCD006□ | FBR161NCD006□ | FBR163SCD006□ | FBR163SCD006□ | 6 VDC | 72 Ω | 83 mA | | | | | |
| FBR161SCD009□ | FBR161NCD009□ | FBR163SCD009□ | FBR163SCD009□ | 9 VDC | 162 Ω | 56 mA | | | | | |
| FBR161SCD012□ | FBR161NCD012□ | FBR163SCD012□ | FBR163SCD012□ | 12 VDC | 288 Ω | 42 mA | | | | | |
| FBR161SCD024□ | FBR161NCD024□ | FBR163SCD024□ | FBR163SCD024□ | 24 VDC | 1,152 Ω | 21 mA | | | | | |
| FBR161SCD048□ | FBR161NCD048□ | FBR163SCD048□ | FBR163SCD048□ | 48 VDC | 4,600 Ω | 10 mA | | | | | |

Note: All values in the table are measured at 20°C.
*: Specified values are subject to puls wave voltage.

## ■ SPECIFICATIONS

| Item | | | — | -K | -H | -W | -HB | -WB |
|---|---|---|---|---|---|---|---|---|
| Contact | Arrangement and Style | | 1 form C or 1 form A, single contact | | | | | |
| | Material | | Silver | Silver-cadmium oxide | | Silver tin oxide alloy | Silver-cadmium oxide | Silver tin oxide alloy |
| | Resistance (initial) | | Maximum 100 mΩ (silver contact at 0.5 A 6 VDC/other contacts at 1 A 6 VDC) | | | | | |
| | Ratings (resistive load) | | 3 A 120 VAC | | 5 A 120 VAC | | 10 A 120 VAC (N.O.)<br>7 A 120 VAC (N.C.) | |
| | | | 3 A 28 VDC | | 5 A 28 VDC | 5 A 28 VDC | | 10 A 28 VDC |
| | Maximum Carrying Current | | 5 A | | | | 10 A | |
| | Maximum Switching Power | | 360 VA or 84 W | | 600 VA or 140 W | 140 W | 1,200 VA | 280 W |
| | Max. Switching Voltage*1 | | 250 VAC or 125 VDC | | | | | |
| | Minimum Switching Load*2 | | 0.3 W (30 mA 5 V) | | | 0.3 W (50 mA 5 VDC) | 0.5 W (10 mA 5 VDC) | 0.5 W (10 mA 5 VDC) |
| Coil | Nominal Power | | Approx. 360 mW (E coil type)/0.5 W (C coil type) (at 20°C) | | | | | |
| | Operating Temperature | | –30°C to +80°C (no frost) *3 | | | | | |
| | Operate Humidity | | 45 to 85% RH | | | | | |
| Time Value | Operate (at nominal voltage) | | Maximum 10 msec | | | | | |
| | Release (at nominal voltage) | | Maximum 5 msec | | | | | |
| Life | Mechanical | | $1 \times 10^7$ operations minimum | | | | | |
| | Electrical (refer to the REFERENCE DATA) | DC | $1 \times 10^5$ operations minimum (at contact rating) | | | | | |
| | | AC | $1 \times 10^5$ operations minimum (at contact rating) | | | | | |
| Other | Vibration Resistance | | 10 to 55 Hz (double amplitude of 1.5mm) | | | | | |
| | Shock Resistance | No contact opening | 100 m/s$^2$ (11 ±1ms) | | | | | |
| | | No damage | 1,000 m/m$^2$ (6 ±1ms) | | | | | |
| | Weight | | Approximately 11 g | | | | | |

*1 If the switching voltage exceeds the rated contact voltage, reduce the current. The current values vary according to the type of load.
*2 Values when switching a resistive load at normal room temperature and humidity, and in a clean environment. The minimum switching load varies with the switching frequency and operation environment.
*3 Based on UL Class A coil insulation system.



## ■ INSULATION

| Item | FBR160 Series |
|---|---|
| Resistance (500VDC) | Min. 100MΩ |
| Dielectric Strength | Open contacts: 500VAC 1 min.<br>Coil and contacts: 1,500VAC 1 min. |

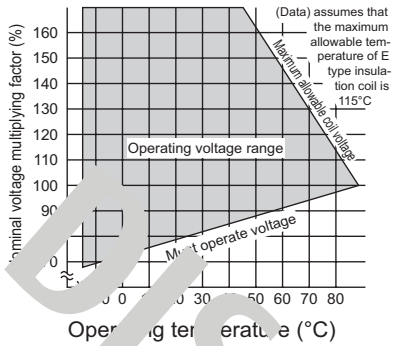
## ■ SAFETY STANDARD AND FILE NUMBERS

| Type | Compliance | Contact rating |
|---|---|---|
| UL | UL 114<br>E 63615<br>(U, UK, UH, UW, UHB, UWB)<br><br>UL 508<br>[illegible]614<br>(R, [illegible]K, RH, RW, RHB, RWB) | Flammability: UL 94-V0 (plastics)<br>[U, UK, R, RK]<br>3A, 120VAC/30VDC (resistive)<br>1/10 HP, 120VAC<br>[UH, UW, RH, RW]<br>5A, 120 VAC/30VDC (resistive)<br>1/6 HP, 120VAC<br>[UHB, UWB, RHB, RWB]<br>10A, 250 VAC/125VAC (N.O. resistive)<br>7A, 250 VAC / 125VAC (N.C. resistive)<br>10A, 30 VDC (resistive)<br>1/8HP, 250VAC/125VAC |
| CSA | C[illegible]2 N[illegible]14<br>[illegible]R 40[illegible]4, L[illegible]1320 or LR 64026<br>(U[illegible]K, UH, UW, UHB, UWB, R, RK, RH, R[illegible] RHB, RWB) | |

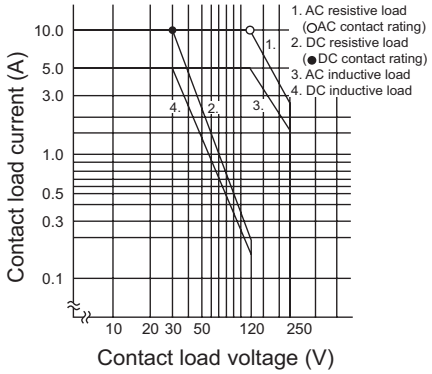
Also complies with VDE

## ■ CHARACTERISTIC DATA

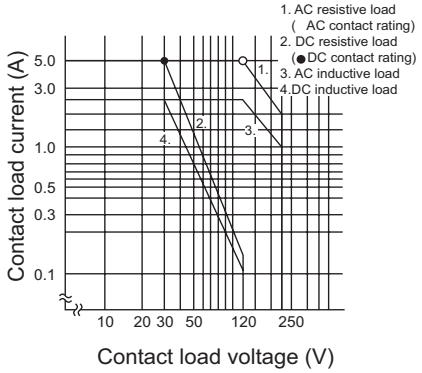
Range of operation temperature and voltage
E type [0.36 W type]



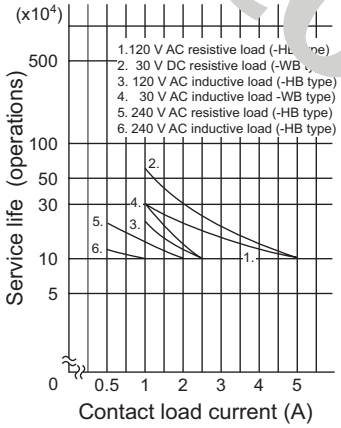

Maximum switching capacity (10 A type)



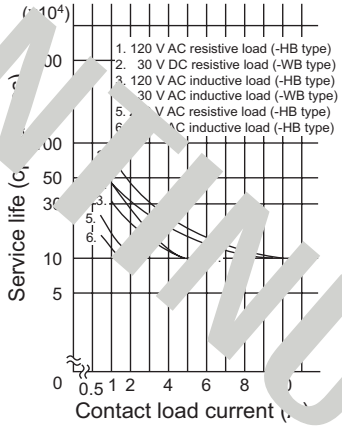

Maximum switching capacity (5 A type)



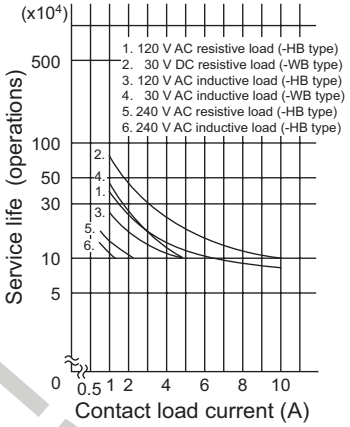

Life curve (5 A type)




Life curve
(10 A type, make side (N.O.))

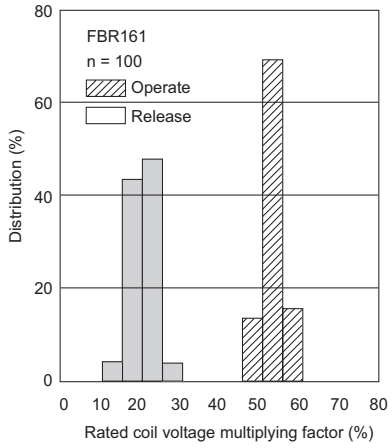



Life curve
(10 A type, breake side (N.C.))

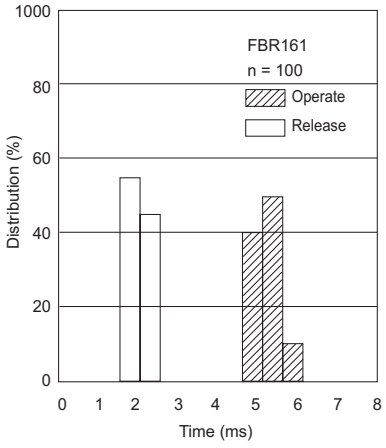



## ■ REFERENCE DATA

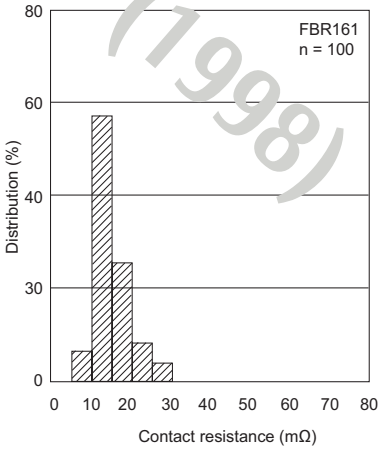
Distribution of operate and release voltage




Distribution of operate and release time

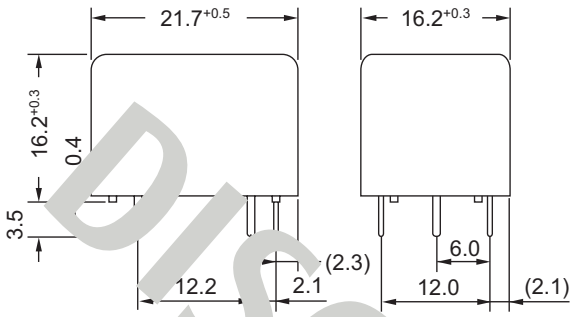



Distribution of contact resistance

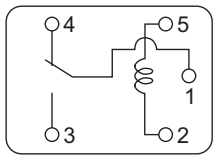


## ■ DIMENSIONS

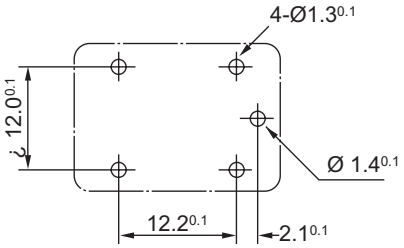
● Dimensions




● Schematic
(BOTTOM VIEW)

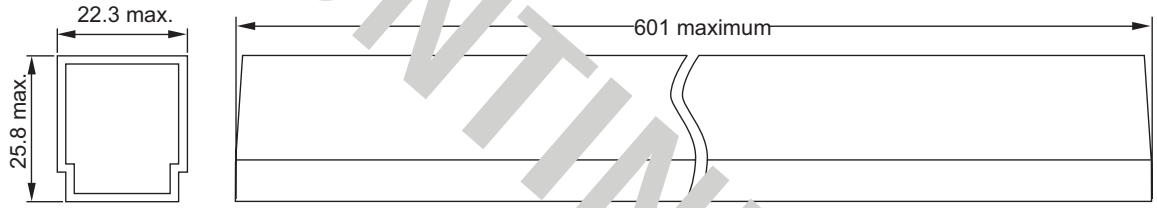



● PC board mounting hole layout
(BOTTOM VIEW)




Note : For 1 form A type, terminal No.4 is removed.

● Tube carrier




25 pieces/tube

Unit: mm



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